

A Curriculum Development Approach to Integrating Various Kinesiology Sub-disciplines

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Abstract: Drawing on the contextual history of the Douglas College Sport Science Department (British Columbia, Canada) combined with the shifting landscape of physical education/kinesiology, this article traces the development of an integrated movement analysis course. Specifically, the developed curriculum is detailed and reflection given on the pragmatic, inquiry-based approach used to develop a course curriculum intended to integrate various kinesiology sub-disciplines. The article explores the combined use of several frameworks to promote meta-cognition and peer-collaboration as students meet the learning outcomes of creating their own evidence-based, intradisciplinary process to analyze movement.

Key words: Kinesiology, physical education, qualitative movement diagnosis, interdisciplinary, intradisciplinary.

1. Introduction

Douglas College is a post-secondary institution located in Metro-Vancouver, British Columbia with two main campuses, one in New Westminster and one in Coquitlam. The Sport Science Department is within the Faculty of Science and Technology and offers three programs of study: a 60-credit SPSC (Sport Science) Diploma, a 128-credit BPEC (Bachelor of Physical Education and Coaching) Degree, and a 30-credit GDPHE (Graduate Diploma in Physical and Health Education). The Sport Science Department accepted the first intake of BPEC students in fall 2007. In the last ten years, numerous BPEC graduates have successfully completed a fifth year of teacher training at University of British Columbia's Bachelor of Education program and Simon Fraser University's Professional Development Program for teaching education preparation.

To build on these successes and help determine future directions, the department conducted a program review in 2012-2013. One of the program review

outcomes was developing the BPEC—Kinesiology Concentration to enhance the kinesiology-related curriculum in response to the increased number of career prospects and graduate programs for BPEC graduates. Students were interested in becoming practicing kinesiologists, and exploring master's degree programs for occupational therapy, rehabilitation sciences, and physiotherapy. In 2014, the Sport Science Department reviewed the third and fourth year curriculum and decided to develop two new courses, Research Methods and Integrated Movement Analysis as part of the BPEC—Kinesiology Concentration. Since introducing this concentration, BPEC graduates have been successfully admitted to masters of physiotherapy, social work, and rehabilitation science programs at Canadian universities. This paper will focus on the development of SPSC 3154 Integrated Movement Analysis course and will detail the inquiry-based approach used to develop the curriculum and student learning outcomes.

2. Transitions of the Physical Education/Kinesiology Field

The development of the Integrated Movement Analysis course originated from understanding the

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historical context and evolving PE/K (Physical Education/Kinesiology) field. A review of Henry's 1964 article begins a shift in PE/K [1]. Henry [1] notes well that the PE/K field is a collection of various yet diverse academic fields, and at best is only a portion of an individual field. The PE/K field comprises portions of humanities, social sciences, physical sciences, and biological sciences. Additionally, as these diverse fields are applied to understanding better the factors related to human physical activity, one can explore the cellular level physiology, human segmental or whole body movements, and/or the sociocultural and psychosocial interactions within a population or community engaging in sport, exercise, or physical activity. As noted by Bice et al. [2], PE/K is a field of melding health-related individuals with diverse areas of scholarly interests and teaching foci. The Douglas College Sport Science Department is a microcosm of what is represented in the broader PE/K field, with varied expertise across diverse academic areas, but keeping exercise, human movement skills, and health at the core of the three sport science programs.

Research in the sub-disciplines of Kinesiology, and even more specifically in specific populations, has increased rapidly in the last 20 years [3]. Several authors provide cogent synopses of the focus of kinesiology academics shifting from specialization in a broad field to the sub-discipline specialization, creating a silo effect of the knowledge bases within PE/K [3-6]. They further discuss the gaps created within the academic departments, the gap between theory and evidence-based practice, and the political and professional consequences relating to grant funding and publication. Along with identifying the problem, they articulate strategies for improving kinesiology evidence-based practice with interdisciplinary and intradisciplinary researches [3-6]. Given the evident transition of the PE/K field since 1964 coupled with situating the Sport Science Department's five-year program review outcomes, the resulting course development was aimed to meet future trajectories for

student career options in kinesiology-related fields.

3. Underpinnings to Designing SPSC 3154 Integrated Movement Analysis

To avoid perpetuating a silo, sub-discipline approach to undergraduate education, the goal in developing SPSC 3154 was an integrated approach for third and fourth year students as suggested by Ward and Kretchman [7]. Furthermore, in recent iterations of the SPSC 3154 curriculum it has been important to tease out the applications of various interdisciplinary and/or intradisciplinary approaches to research and teaching [5]. Since the BPEC—Kinesiology Concentration at its core is an applied degree, it is imperative to ensure a practical aspect while using sub-discipline integration in the class. Additionally, the approach used intends to promote meta-cognition and autonomous student learning in which students ask questions and either begin to answer their questions or rely on peer-collaboration to answer what appears to be unknown.

The approach to developing SPSC 3154 was to provide a curriculum platform in which students develop for themselves a process to conduct a movement analysis based on their interest, as well as their previous experiences. Drawing on their experiences, supported by inquiry-based learning, they were positioned to understand better the complexity and interrelations of various factors impacting human movement [8]. Students were introduced to a mixed methods inquiry strategy, specifically using a concurrent approach. This fusion of data analysis methods allowed students to explore qualitative and quantitative approaches to studying human movement using the qualitative movement diagnosis framework [9]. Thus, Knudson's [9] textbook "Qualitative Diagnosis of Human Movement: Improving Performance in Sport and Exercise (3rd edition)" was the first-choice textbook. As well, students were provided additional supplemental peer-reviewed articles.

3.1 Curriculum Development across the Semester

Curriculum was developed considering time to work through the learning process and course content in a way that students constructed for themselves a learning scaffold during the first half of the semester. Then, during the second half of the semester, students generated a high-level diagnosis process and worked to fill in the necessary details of their constructed movement analysis process. Early on, the students were introduced to the four part qualitative movement diagnosis framework (preparation, systematic observation, evaluation and diagnosis, and intervention) and how it is to be used iteratively in the course project [9]. Then, the students explored Forsher's [10] and Biddle's [11] papers to understand the complexity and importance of not only reading but also evaluating peer-reviewed research. As there are many gaps in inter- and intradisciplinary kinesiology work, they explored through writing tasks and discussion sessions the meta-analysis approach Biddle [11] and Knudson [4] present. As noted in Hsieh and Knudson [8], students were more motivated to explore the course topics when they had choice in the human movement they were analyzing.

By three weeks after exploring the Knudson [9] text, Hudson's [12] integrated approach, and using the Morrison and Harrison's [13] earlier integration work, students were assigned the task of developing a concept map about one performer doing one skill in an environment chosen by the student. At the start of the concept map, SPSC 3154 students decided on three high level details: the skill, the performer, and the environment. These details were not determined by the instructor. Quite quickly, this decision autonomy sparked student questions about what to consider when deciding upon who, what, and where. These sparked questions were exactly the point of the assignment as the process encouraged them to think divergently and explore the many varieties of responses and scenarios to their own questions. Furthermore, to build on their meta-cognition and their collaboration skills, students

were in peer teams of three to further questions and discuss with each other the initial approaches to their analysis process development. As noted by Bice et al. [2], this approach cognitively pushes students outside their comfortable boundaries of one sub-discipline per course and into a puzzling scenario of exploration.

At this stage of the project, the author perceives students need reassurance and guidance because of perceived project ambiguity. To support their inquiry into identifying connections across the sub-disciplines, one example the students were required to read is Wulf [14], which provides a review of literature connecting biomechanics variables of motor performances and motor learning to the performer using internal versus external focus. This example is one of several integrated connections between the sub-disciplines students use while collaborating with peers to make decisions about their own qualitative movement diagnosis project [9]. Moreover, time was dedicated to another framework students may use in the class. Graham et al.'s [15] Knowledge to Action Cycle process is discussed with students. This framework's utility is that it is underpinned with the evidence-based health care field in Canada, which has close connections to kinesiology, as the practitioner engages with client/stakeholder and the current research. As students will be tasked with engaging a client in the form of a student, athlete, parents, or clinical-setting client, it is a useful framework for helping student integrate various sub-disciplines of research in an evidence-based and communicative way with their instructors, peers, and stakeholders, which in this class is the performer's movement [15].

Much of the first third of the course was spent acquainting the students with being more comfortable outside their comfort zone by proposing the divergent thinking, beginning inquiry into a skill of choice, and recognizing the current interdisciplinary research that exists for the skills many students were diagnosing. During this time students were presented with the metaphor of trying on shoes and one must try on a

couple of different pairs and go with the best for comfort, cost, and function. Initially students used the concept map to explore the skill, performer, and environment.

As students transition into the middle half of the course, they began the four-part project using qualitative movement diagnosis framework: preparation, systematic observation, evaluation and diagnosis, and intervention [9]. For the preparation portion, students detail all relevant information that is needed to diagnosis a movement and create a data collection sheet (paper or electronic) on which to record pertinent information for a diagnosis. Then, for systematic observation, they developed a plan detailing how to collect the various performer information and performance metrics in the chosen environment. Next, for evaluation and diagnosis, they analyzed data and evaluated the strengths and weaknesses of the performances in the given environment. Lastly, for the intervention, the students created a strategy on how to promote the performance strengths and improve weaknesses. At each stage, students continued using peer collaboration and inquiry-based approaches to make decisions about what qualitative and quantitative approaches would best inform them for a valid and reliable diagnosis. Additionally, since many students plan to be teachers, coaches, and/or kinesiologists, they worked through written and oral communications at each stage with the performer to ensure data collection validity and reliability, which was needed for the evaluation, diagnosis, and intervention.

In the final weeks of the semester and upon completing the four project parts, the students prepared mini-presentations to occur over three successive class meetings. Students were expected to shift perspectives within the qualitative movement diagnosis framework and consider “selling” their process to an employer. Depending on the skill, performer, and environment they had chosen, these potential employers would be different for every student. This final presentation served two learning purposes for the students. One,

preparing for the presentation provides a culminating opportunity for meta-cognition as students retraced the steps of process development and determined the strengths and weaknesses of what they developed. Second, students were part of the audience for ten peer presentations in an open and supportive environment. In the author’s three years observing these presentations, the author has witnessed students ask numerous critical questions and demonstrate openness to varied data collection approaches. Most importantly, the author attests that the students clearly have attempted, and the majority quite successfully, to integrate various kinesiology sub-disciplines through the project and presentation.

3.2 Reflections of the Curriculum

Reflecting on three years of SPSC 3154, students consistently and successfully created a diagnostic process of how to work through the four-part framework of systematic data collection to create a comprehensive human movement diagnosis. Though often reluctant at first, the students persevere through the freedom of autonomous, peer-collaborative learning and realize at the end they have created a process unique to themselves, yet one that is evidence-based. Many students noted that it was the first class in which they were empowered to try on the field of kinesiology and challenged to integrate the various sub-disciplines in a meaningful way that also acknowledges the student’s prior experiences. They have shifted their approach to consider the interrelationships among the various sub-disciplines and practice the humility to assimilate other’s feedback to make their own process better. Additionally, they rise to the challenge of enhancing their listening and critical thinking by providing meaningful feedback to their peers.

4. Conclusions and Future Directions

There are a few notable changes that may be incorporated into subsequent offerings of SPSC 3154

Integrated Movement Analysis. The foremost change will be exploring in more detail the interdisciplinary and intradisciplinary research definitions and the intermediary continuum details in Schary and Cardinal [5]. It is imperative to use current working definitions from the rising kinesiology professionals to contextualize and better understand their peer-reviewed research readings. Moreover, leading discussions and inquiry sessions to further understand the various definitions will provide students a better foundation for developing their own customized qualitative movement diagnosis process. Additionally, the curriculum will include the Bice et al. [2] article to provide students a richer context outlining the barriers to collaboration; a situation real and present in kinesiology. Exploring these barriers to collaboration will round out the curriculum as it may be easily related to Forsher's [10] famous letter encouraging the construction of edifices versus more bricks.

Incorporating Bice et al. [2] into the SPSC 3154 course content will provide students with a more comprehensive context before they begin the process of identifying and integrating the various kinesiology sub-disciplines. The richness for the students comes not in creating the perfect process, but in an evidence-based attempt to integrate the varied academic fields of kinesiology to examine human movement, provide instruction, and help humans move better while gleaned health-related improvements. With this one course as part of the BPEC-Kinesiology Concentration, the hope is that future physical educators and health care practitioners will use an evidence-based practice, including knowledge from the various academic fields comprising kinesiology, to enhance communication with their supervisors, colleagues, students, and clients.

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